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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,869	06/29/2001	Li-Chun Wang	2685/5860	6553

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EXAMINER

NGUYEN, DUC M

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PRC

Office Action Summary

Application No.
09/893,869

Applicant(s)
Wang

Examiner
Duc Nguyen

Art Unit
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-33 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jun 29, 2001 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

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DETAILED ACTION

This action is in response to Applicant's response filed on 8/5/02. Claims 16-33 are now pending in the present application.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in claim 24. Therefore, the "distance of 1.5 R" must be shown in a drawing or the feature(s) be canceled from the claims. No new matter should be entered.

Claim Objections

2. Claim 24 is objected to because of the following informalities: the "NBTC" should be spelled out at least once in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 16-20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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Claim 16 recites the limitation of "a frequency reuse pattern in which each frequency set occurs **at least twice** in a cluster of four cells". Accordingly, by occurring **more than two** (i.e., occur N times whereas $N > 2$) in a cluster of four cells, the frequency reuse factor K would be $4/N$ which corresponds to a frequency reuse factor of 0 to 2 (i.e., $0 < K < 2$). The limitation of "frequency reuse factor $K < 2$ " is a new subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

5. Claims 24-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 24 recites the limitation of "base stations that are separated from one another by a distance of **1.5 R**". The limitation of "**1.5 R**" is never described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 16, 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faruque ("N-4 tri-cellular plan with Alternate Channel assignment", Proc. of MILCOM, Nov. 6-8, 1995, pp.1244-1247, IEEE) in view of Schaeffer (US Pat No. 5,073,971).

Regarding claim 16, Faruque discloses a method for allocating communications resources in a communications system, comprising a cluster of base stations with 3-hexagonal sectors disposing in a honeycomb pattern in a mutually interlocking arrangement (see Fig. 4.2) with frequency reuse factors of 3 or 4. However, Faruque fails to disclose a frequency reuse factor of 2 in which each frequency occurs twice in a cluster of four cells. However, Schaeffer discloses a frequency reuse method for a cluster of 4 cells repeat pattern wherein a frequency reuse factor of 2 or each frequency used twice in a cluster of four cells is used (see col. 3, line 51-54). Here, since the use of a 3-sectors cell or a 6-sectors cell is well known in the art, and since using a frequency reuse factor of K , for $K > 0$ is also well known in the art, whereas their selection values (N -sectors cell or frequency reuse factor k) are depend on the available channel bandwidth, hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Schaeffer's teaching to Faruque for using a frequency reuse factor of $K=2$ so that frequency channels for reuse is reused more as compared to $K=3$ or greater,

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thereby reduce the number of channels required in a certain service area. Or, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Faruque's teaching to Schaeffer for using 3-sectors cells so that the number of channels required in a certain service area can be reduced as compared to a 6-sectors cell. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teachings of Schaeffer and Faruque for using a frequency reuse factor of 2 in base stations with 3-hexagonal sectors, for effectively reuse the bandwidth of a communication system so that the number of channels required in a certain service area can be reduced to fall within the number of available channels in such area..

Regarding claim 19, it is rejected for the same reason as set forth in claim 16 above. In addition, Faruque and Schaeffer as modified would disclose a frequency reuse factor of 2 is used (see Schaeffer, col. 3, line 51-54).

Regarding claim 20, it is rejected for the same reason as set forth in claim 16 above. In addition, since Faruque and Schaeffer as modified would disclose a frequency reuse factor of 2 in a 3-sectors cell, hence by definition, the corresponding number of channel sets would be equal to the number of sectors (3) multiplying with the frequency reuse factor of 2 ($3 \times 2 = 6$) in order to have the above correlated features. Therefore, the claimed limitations are made obvious by Schaeffer and Faruque for using six channel sets as claimed, in order to have a 4 tri-cells repeat pattern with each frequency used 2 times (see Schaeffer, col. 3, lines 51-54).

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Regarding claim 21, the claim is interpreted and rejected for the same reason as set forth in claim 20 above.

Regarding claim 22, the claim is rejected for the same reason as set forth in claim 20 above. In addition, **Faruque** and **Schaeffer** as modified would disclose each cell in the cluster is assigned a group of frequency sets that is unique within the cluster (see **Schaeffer**, Fig. 4).

Regarding claim 23, the claim is rejected for the same reason as set forth in claim 20 above. In addition, **Faruque** and **Schaeffer** as modified would disclose the frequency resources are allocated to provide at least one other sector between the two sectors that share a frequency set (see **Schaeffer**, Fig. 4).

Regarding claims 30-32, the claims are interpreted and rejected for the same reason as set forth in claim 20 above.

Regarding claim 33, the claim is rejected for the same reason as set forth in claim 20 above. In addition, **Faruque** and **Schaeffer** as modified would disclose two sectors having the same assigned frequency set are separated by a third sector having a different assigned frequency set (see **Schaeffer**, Fig. 4).

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Faruque** in view of **Schaeffer** and further in view of **Brodie** (PCT Pub. No. WO 9634505).

Regarding claim 18, **Faruque** and **Schaeffer** as modified would disclose all the claimed limitations, see claim 16 above, except for directional antennas having beamwidths of 50 to 70

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degrees. However, Brodie discloses a method for frequency reuse in a communications system wherein the antennas have a beamwidth of 50 to 70 degrees (see Fig. 2 and page 3, lines 15-16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further combine or provide the above teaching of Brodie to Faruque and Schaeffer for using antennas with narrow beamwidths as claimed, in order to reduce channel interferences as compared to overlapping wide beamwidths.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 16-33 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 6,002,935. Although the conflicting claims are not identical, they are not patentably distinct from each other because

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they are both directed to a frequency reuse method in a communications system wherein each frequency is used 2 times in a cluster of 4 tri-cells repeat pattern.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **Vasudaran et al**, "A novel frequency transition scheme for capacity enhancement in a cellular radio system", Universal Personal Communications, 1998. ICUPC'98. IEEE 1998 Inter. Conf, volume 2, pages 1331-1336.

12. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington VA, Sixth Floor (Receptionist).

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Any inquiry concerning this communication or communications from the examiner should be directed to Duc Nguyen whose telephone number is (703) 306-4531.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Duc Nguyen

A handwritten signature in black ink, appearing to read 'Duc Nguyen', written in a cursive style.

Sept 18, 2002